A Summary of the 2003 TMDL Monitoring for Diazinon and Chlorpyrifos in the Northern San Joaquin Basin, California

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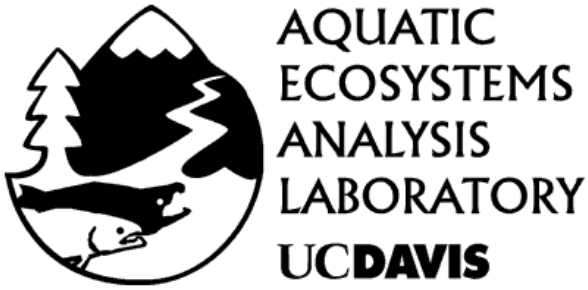


Contents

Figures

Tables

Introduction

This report describes the results of pesticide monitoring at thirteen locations in eight waterways of California's southern Central Valley associated with irrigation runoff that occurred during the months of March-August of 2003. The river loading rates of diazinon and chlorpyrifos were also calculated for each sampling event. Monitoring was conducted by staff of the Aquatic Ecosystems Analysis Laboratory (AEAL) of the John Muir Institute of the Environment, University of California, Davis, as authorized under Contract No. 02-210-150 from the Central Valley Regional Water Quality Control Board (CVRWQCB).

Objective

The primary objective of this project was to monitor thirteen sites in the northern San Joaquin River basin during the 2003 irrigation season to characterize and define the sources of diazinon, chlorpyrifos and other pesticides that can cause surface water contamination and toxic conditions to aquatic life. The results of this study will be used to support the development of diazinon and chlorpyrifos TMDL's in the northern San Joaquin basin.

Monitoring Overview

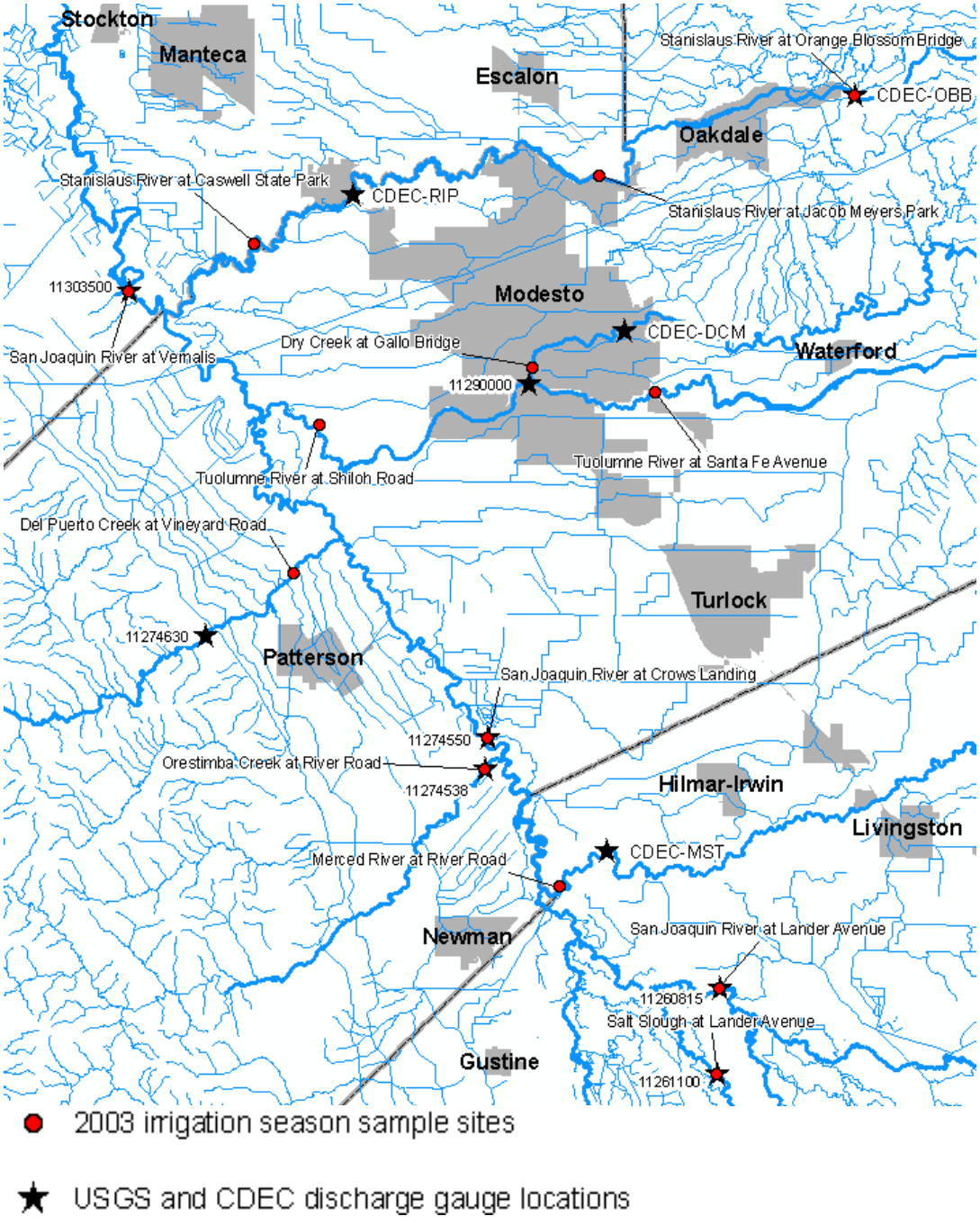
Thirteen sites (Figure 1, Table 1) were monitored once every two weeks from March 27 – June 5 and then once per week from June 12 – August 28, 2003.

The measured field parameters included pH, water temperature and electrical conductivity (EC). Discharge measurements for selected sites were obtained from U.S. Geological Survey (USGS) and California Department of Water Resources (DWR) data (Table 2) available on the internet. Water samples were delivered to the California Department of Food and Agriculture (CDFA) laboratory in Sacramento, California for chemical analysis using gas chromatography (GC) and mass spectrometry (MS).

The CDFA laboratory analyzed 17 chemical compounds for each water sample. The list of compounds is provided in Table 3. The detection frequency, concentrations and calculated instantaneous loading rates for diazinon and chlorpyrifos are presented in

Table 4. The chemical analysis results for all tested compounds, and the physical parameters measured in the field are presented in tabular format on a compact disc appended to this report.

Figure 1. The thirteen sampling sites in the San Joaquin Basin monitored for pesticides during the irrigation season 2003.



Site #	Site Name	Sample collection Method	Sampling Frequency	Sampling Dates
1	Merced River at River Road	Integrated grab from bridge	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
2	Orestimba Creek at River Road	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
3	San Joaquin River at Crows Landing	Grab from pier	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
4	Del Puerto Creek at Vineyard Road	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
5	Tuolumne River at Shilo Road	Integrated grab from bridge	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
6	San Joaquin River at Vernalis	Integrated grab from bridge	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
7	Stanislaus River at Caswell State Park	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
8	Dry Creek at Gallo Bridge	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
9	Tuolumne River at Santa Fe Road	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
10	Stanislaus River at Orange Blossom	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
11	Stanislaus River at Jacob Meyers Park	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
12	Salt Slough at Lander Avenue	Grab from bank	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003
13	San Joaquin River at Lander Avenue	Integrated grab from bridge	once every 14 days once every 7 days	3/27/2003 –6/5/2003 6/12/2003 – 8/28/2003

Table 1. Sample sites, collection methods, frequency and sampling dates

Sample Collection Methods

All samples were collected either grab or integrated grab methods (Table 1). Grab samples were collected by harnessing a 1-liter amber glass bottle into a pole sampler and dipping the bottle into the stream as close to the center of the channel as possible.

Integrated grab samples were collected by lowering a 3-liter PTFE (polytetrafluoroethylene) bottle, strapped in a weighted cage, from a bridge at three equally spaced verticals. At each vertical the bottle was filled approximately ¼ full. The composite sample was then thoroughly agitated and poured into a 1-liter amber glass sample bottle.

Discharge Sources, Methods and Stream Drainage Characteristics

Discharge estimates were obtained from USGS and DWR gages listed on the California Data Exchange Center (CDEC) http://cdec.water.ca.gov/ website. At sites where discharge gages were not present discharge values from the nearest gage on the same stream were used. Where appropriate, a time-offset was applied to discharge values from nearby gages to better estimate discharge at the sampling site at the time of sample collection. An explanation of the discharge source, any adjustments applied to discharge data and characteristics of the stream drainage are listed below for each site.

Merced River at River Road – Data for this site were obtained from the CDEC gage MST (Merced River at Stevinson) located approximately 3.68 miles upstream. The gage elevation is 59 feet and the sample site elevation is 53 feet. The low gradient (6 feet over 3.68 miles) and the size of the river allowed us to make the assumption that the river rises fairly uniformly under normal conditions, therefore, flow data were used unadjusted from the CDEC site. There is one semi-permanent stream between the sample site and the discharge gage. Flows are unknown for this stream and were assumed to be negligible. The river flows through an urban area near Livingston about 20 miles upstream from the sample site.

Orestimba Creek at River Road - USGS Discharge Station number 11274538 (Orestimba Creek at River Road Near Crows Landing) is located at the sampling site. Mark Woloszyk of USGS provided hourly discharge data that was not available on the internet. Orestimba Creek is an ephemeral stream that is representative of the small western tributaries to the San Joaquin River. It does not flow directly through any urban areas. Both the USGS and the California Department of Pesticide Regulation (CDPR) have also collected water samples at this site as part of the National Water-Quality Assessment Program (NAWQA).

San Joaquin River at Crow's Landing – USGS gage 11274550 is located at the sampling site. Mark Woloszyk of USGS provided hourly discharge data unavailable on the internet. The Crow's Landing site is located between the major inputs of the Merced River to the south and the Tuolumne River to the north.

Del Puerto Creek at Vineyard Road - USGS Discharge Gage 11274630 (Del Puerto Creek at Patterson) was used for this site. It is located at a narrowing of the

channel in the hills west of the San Joaquin Valley. The gage is approximately 4.89 miles upstream of the sampling site and 122 feet higher in elevation. We took streambed data in order to determine flow velocity. A delay of four hours was applied to the discharge data to account for the distance between the discharge gage and the sampling site. The creek passes under the Delta-Mendota Canal through a siphon between the two sites. No water is diverted into or out of the creek at this point. There are no significant streams entering the creek between the discharge gage and the sample site, but runoff from the surrounding fields enters the creek along most of this length below the siphon. There are also several fields that have pipes draining their runoff to Del Puerto Creek, although these fields are not adjacent to the creek.

Tuolumne River at Shilo Road **-** The CDEC gage MOD (Tuolumne River at Modesto) was used to obtain discharge measurements for the sampling site. There are no other suitable gages for making any kind of distance weighted hydrograph so the data were used as presented on the CDEC website. There are significant urban areas upstream including Modesto and Waterford. Since we did not measure discharge at this site and no other measures were taken to determine the applicability of the Tuolumne-at-Modesto discharge data, we cannot draw any conclusions about the accuracy of the discharge estimates.

San Joaquin River at Vernalis – The USGS and DWR jointly operated discharge station 11303500 (San Joaquin River near Vernalis) was used for this site. The sampling site and gage are both located at the Durham Ferry highway bridge. Data were used unadjusted from the CDEC website. This location is approximately 2.6 miles downstream of the confluence with the Stanislaus River. The drainage area is approximately 13,536 mi^2 and also incorporates the flows of the Merced and Tuolumne rivers, Orestimba, Del Puerto and Dry creeks and Salt Slough.

Stanislaus River at Caswell State Park - Discharge was obtained from USGS gage 11303000 on the Stanislaus River near Ripon, approximately eight miles upstream of the sampling site. The CDEC data were used unadjusted from the Ripon station. The river flows through an urban area at Ripon and through several urban areas upstream of Ripon.

Dry Creek at Gallo Bridge - California Department of Water Resources Discharge Station DCM (Dry Creek at Modesto) was used for this site. DCM is located approximately 5 miles upstream from the sampling site. There is a 26 ft. difference in elevation between the gage and the sampling site with no significant inputs between the two locations. The relatively high slope and small size of this stream make it possible that flows would be markedly different between sampling site and discharge gage at any given time.

We collected data about the streambed in order to make a determination about the velocity of flows in this stream. The Mannings roughness coefficient (n) was determined at .056, relatively high for a stream in the valley, mostly due to the presence of large amounts of vegetation in the streambed. The slope is .0009982. The velocity that we determined from the Manning equation and slope was approximately 1 mile per hour.

We used this velocity to determine the delay between DCM and the sampling site; shifting flows back five hours to account for the delay.

The creek flows through the middle of Modesto, as well as flowing through other semi-urban areas before it reaches Modesto.

Tuolumne River at Santa Fe Road - CDWR discharge station MOD (Tuolumne at Modesto) was used for this site. It is located 5.79 miles downstream from the sampling site. The only significant input between these two locations is Dry Creek, which joins the Tuolumne ½ mile upstream of the discharge gage. Flows for Tuolumne at Santa Fe were calculated by subtracting the flows of Dry Creek at Modesto from those of the Tuolumne at Modesto

There are no significant urban areas upstream of this site, but some urban influence is present for several miles upstream.

Stanislaus River at Orange Blossom - CDWR discharge station OBB (Stanislaus at Orange Blossom Bridge) was used for this site. It is located at the sampling site. Flows were taken unadjusted from the CDEC website.

The nearest upstream urban area is approximately 8 miles at Knights Ferry. Above this sample site the stream flows mostly through hills and has less agricultural influence than the other streams in the study.

Stanislaus River at Jacob Meyers Park - USGS discharge station 11303000 (Stanislaus near Ripon) and CDWR station OBB (Stanislaus at Orange Blossom Bridge) were used to derive a distance weighted flow rate for this site. The Ripon gauge is approximately 17 miles downstream of the sample site at 45 feet elevation. The OBB gauge is 13.44 miles upstream from the sample site, at 120 feet elevation. The sample site is at 85 feet elevation. Discharges were estimated by averaging the readings from the two gages at the time of sample collection.

There are urban influences all along this stretch of the river from Ripon to Orange Blossom.

Salt Slough at Lander Avenue – Data for this site were obtained from the CDEC gage SSH. The gage and sampling site are both located at the Lander Avenue crossing.

Salt Slough drains subsurface discharges of agricultural drainwater from the Kesterson Wildlife Refuge in the Grassland watershed.

San Joaquin River at Lander Avenue – Data for this site were obtained from the CDEC gage SJS. The gage and sampling site are both located at the Lander Avenue crossing. This is the most upstream sampling site on the San Joaquin River and is also upstream of the confluences of the San Joaquin River and each of the other sampled water bodies.

Table 2. Sampling Sites Discharge Sources

Site Discharge Information							
Site #	**Site Name**	**USGS ID #**	**CDEC ID #**	**Agency**	**Type**	**Lat**	**Long**
1	Merced River at River Road	---	MST	DWR	Hourly	37°22'16"	120°55'52"
2	Orestimba Creek at River Road	11274538	OCL	USGS	Daily	37°24'49"	121°00'54"
3	San Joaquin River at Crows Landing	11274550	SCL	USGS	Hourly	37°25'55"	121°00'46"
4	Del Puerto Creek at Vineyard Road	11274630	---	USGS	Daily	37°29'12"	121°12'29"
5	Tuolumne River at Shilo Road	11290000	MOD	USGS/DWR	Hourly	37°37'38"	120°59'11"
6	San Joaquin River at Vernalis	11303500	VNS	USGS	Hourly	37°40'01"	121°16'01"
7	Stanislaus River at Caswell State Park	11303000	RIP	USGS	Hourly	37°43'48"	121°06'32"
8	Dry Creek at Gallo Bridge	---	DCM	DWR	Hourly	37°39'25"	120°55'23"
9	Tuolumne River at Santa Fe Road	11290000	MOD	USGS/DWR	Hourly	37°37'38"	120°59'11"
10	Stanislaus River at Orange Blossom	---	OBB	DWR	Hourly	37°46'59"	120°45'00"
11	Stanislaus River at Jacob Meyers Park	---	OBB / RIP	DWR/USGS	Hourly	37°43'48"	121°06'32"
12	Salt Slough at Lander Avenue	11261100	SSH	USGS	Hourly	37°14'52"	120°51'04"
13	San Joaquin River at Lander Avenue	---	SJS	DWR	Hourly	37°17'43"	120°51'01"

Loading Rate Calculation

Instantaneous loading rates of diazinon and chlorpyrifos were calculated by multiplying the stream discharge at the time of sample collection with the measured concentrations of each pesticide by the number of seconds (86,400) in one day. Loading rates were only calculated when the pesticide concentration was above the limit of detection and a discharge estimate was available. For all samples where pesticide concentrations were below the limit of detection the loading rate was assumed to be zero.

The highest and lowest calculated instantaneous loading rates for diazinon were in the Tuolumne River at Santa Fe Road and Del Puerto Creek at Vineyard Road, respectively. The highest and lowest calculated instantaneous loading rates for chlorpyrifos were in the Stanislaus River at Caswell State Park and Del Puerto Creek at Vineyard Road, respectively.

Laboratory Analysis Methods

Upon arrival at the CDFA laboratory, the environmental samples were weighed. Each sample was spiked with 500µL of 1.0 µg/ml chlorpyrifos methyl (0.5µg/mL) surrogate spiking solution. Each sample was emptied into a 2-liter size separatory funnel and approximately 10-15g of granular sodium chloride were added. Sixty ml of methylene chloride were added and the sample was mixed for three minutes. The organic fraction was filtered through a bed of granular anhydrous sodium sulfate (approx. 20g). The extraction process was repeated three times and the resultant sample evaporated to 5-7 ml at 40° C, then evaporated to dryness with an N-evaporator. 1.0ml of methylene chloride and 10µL of a 5.0µg/mL internal standard solution were added to each sample. Samples were stored in a –5ºC freezer until analysis. Samples were analyzed with an Agilent Model 5973 GC-MSD using a HP-5MS or equivalent GC column. Analysis was performed in the selective ion-monitoring mode.

Each sample was analyzed for seventeen compounds. The compounds and their respective limits of quantitation (LOQ) and limits of detection (LOD) are listed in Table

3. The lab reported estimated values when the values were below the LOQ but above the LOD. To ensure the accuracy and precision of the sample analysis, lab spikes, blanks, and a surrogate standard (chlorpyrifos methyl) were used. If the recovery of a spike sample was out of the control range, the water sample was re-analyzed.

Table 3. CDFA Laboratory limits of detection and practical quantitation limits for select pesticides

Compound	Limit of Detection (LOD in µg/L)	Limit of Quantitation (LOQ in µg/L)
Azinphos methyl	0.007	0.050
Bifenthrin	0.007	0.050
Carbaryl	0.007	0.020
Chlorpyrifos	0.004	0.010
Cyanazine	0.007	0.050
Cyfluthrins	0.070	0.200
Cypermethrins	0.070	0.200
Dacthal (DCPA)	0.007	0.050
Diazinon	0.007	0.020
Disulfoton	0.007	0.020
EPTC (Eptam)	0.020	0.050
Esfenvalerate	0.007	0.050
l-Cyhalothrin	0.030	0.100
Methidathion	0.010	0.030
Metolachlor	0.007	0.020
Propargite	0.150	0.500
Simazine	0.005	0.200

Quality Assurance Objectives

Sampling during the 2003 irrigation season was conducted under the guidance of a draft Quality Assurance Project Plan (QAPP) (San Joaquin River TMDL Quality Assurance Project Plan Azimi-Gaylon and Reyes, 2002). The draft QAPP stated the Quality Assurance Objective (QAO) for precision was a relative percent difference (RPD) of less than 50%. No QAO was stated for accuracy. Accuracy is measured by determining the percent recovery of known concentrations of analytes spiked into environmental samples or reagent water before extraction. A 70-130% recovery rate is commonly viewed as acceptable (D. McClure, pers. comm.) and, for the purpose of this report, will be used as the QAO for accuracy in laboratory analytical measurements. When reporting analytical results it is customary to flag those results that fall outside of

the acceptable level of recovery as stated in the QAOs. For the purpose of this report all results outside of the 70-130% recovery range will be flagged as follows: B = biased low due to low surrogate recovery in sample; BL = biased low due to low surrogate recovery in associated lab blank or lab spike.

Results

A total of 234 environmental samples (Table 4) and 15 quality control (QC) samples (Table 5) were collected and analyzed.

Environmental samples

Concentrations of diazinon and chlorpyrifos ranged from below detection to 1.200 parts per billion (ppb) of diazinon and 0.078 ppb chlorpyrifos at Orestimba Creek on 21 and 7 August 2003, respectively (Table 4).

Other pesticides detected in the environmental samples were Eptam, Carbaryl, Metolachlor, Bifenthrin, Cyan-azine, Proparigate and Simazine (Table 4).

Quality Control Samples

Sample quality control was measured through collection of sequential duplicates (n=5), field blanks (n=5) and matrix spikes (n=5). Duplicate samples provided a measure of analytical precision; field blanks were used to evaluate possible introduction of contaminants during sample collection, handling and transport to the lab; and matrix spikes were used to evaluate the relative percent recovery of spiked chemicals by the extraction from the sample matrix. The procedures used for collecting the QA/QC samples were based on the San Joaquin River TMDL Quality Assurance Project Plan (Azimi-Gaylon and Reyes, 2002).

The relative percent difference (RPD) between environmental and duplicate sample concentrations of chlorpyrifos ranged from 0-25% (Table 5). No RPDs were calculated for diazinon because only one duplicate sample showed a concentration above the LOD and the corresponding environmental sample was less than the LOD.

The percent recovery of chlorpyrifos and diazinon in the matrix spike samples ranged from 76-108%, and 66-120% respectively (Table 5).

No analytes were detected in any of the field blanks. A summary of the environmental data is presented in Table 4.

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
1	Merced R @ River Rd	11273500	3/27/2003	10:10	212	ND	NA	(0.018J)	9.34
			4/10/2003	11:20	260	BL, ND	NA	BL, ND	NA
			4/24/2003	10:20	551	B, ND	NA	B, ND	NA
			5/8/2003	10:20	1438	ND	NA	ND	NA
			5/22/2003	9:20	252	(0.005J)	3.08	ND	NA
			6/5/2003	10:00	185	ND	NA	ND	NA
			6/12/2003	10:00	161	ND	NA	ND	NA
			6/19/2003	8:40	290	ND	NA	ND	NA
			6/26/2003	10:00	347	ND	NA	ND	NA
			7/3/2003	8:50	114	BL (0.008J)	2.23	BL, ND	NA
			7/10/2003	9:40	112	ND	NA	ND	NA
			7/17/2003	10:20	109	0.016	4.27	ND	NA
			7/25/2003	9:10	81	(0.006J)	1.19	ND	NA
			7/31/2003	8:50	69	0.010	1.69	ND	NA
			8/7/2003	9:40	96	ND	NA	ND	NA
			8/14/2003	10:00	73	(0.008J)	1.43	ND	NA
			8/21/2003	9:20	83	0.012	2.44	ND	NA
			8/28/2003	9:10	68	ND	NA	ND	NA
2	Orestimba Creek at River Road	11274538	3/27/2003	10:20	5.4	ND	NA	ND	NA
			4/10/2003	11:30	5.4	BL, ND	NA	BL, ND	NA
			4/24/2003	10:40	14	B, ND	NA	B, ND	NA
			5/8/2003	10:40	11	0.051	1.37	(0.008J)	0.22

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Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			5/22/2003	9:50	13	ND	NA	0.020	0.64
2	Orestimba Creek at River Road	11274538	6/5/2003	10:20	11	0.012	0.32	ND	NA
	Continued		6/12/2003	10:20	11	ND	NA	(0.012J)	0.32
			6/19/2003	9:00	14	ND	NA	ND	NA
			6/26/2003	10:10	5.1	0.016	0.20	ND	NA
			7/3/2003	9:10	22	BL 0.020	1.08	BL, ND	NA
			7/10/2003	10:00	25	(0.007J)	0.43	ND	NA
			7/17/2003	10:40	13	0.016	0.51	ND	NA
			7/25/2003	9:40	15	0.014	0.51	0.034	1.25
			7/31/2003	9:10	11	(0.008J)	0.22	(0.009J)	0.24
			8/7/2003	10:00	16	0.088	3.44	0.078	3.05
			8/14/2003	10:20	9.7	0.030	0.71	0.022	0.52
			8/21/2003	9:40	9.7	1.200	28.48	ND	NA
			8/28/2003	9:30	4.2	0.047	0.48	ND	NA
3	San Joaquin River at Crow's Landing	11274550	03/27/03	10:40	961	(0.008J)	18.81	ND	NA
			4/10/2003	11:50	745	BL, ND	NA	BL, ND	NA
			4/24/2003	10:50	1000	B, ND	NA	B, ND	NA
			5/8/2003	10:50	1670	ND	NA	ND	NA
			5/22/2003	10:20	604	ND	NA	(0.007J)	10.34
			6/5/2003	10:30	527	ND	NA	ND	NA
			6/12/2003	10:30	490	ND	NA	ND	NA
			6/19/2003	9:10	439	ND	NA	0.029	31.15
			6/26/2003	10:30	527	ND	NA	ND	NA
			7/3/2003	9:20	453	BL, ND	NA	BL, ND	NA
			7/10/2003	10:10	435	ND	NA	ND	NA
			7/17/2003	11:10	361	ND	NA	ND	NA

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Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			7/25/2003	10:00	317	(0.005J)	3.88	ND	NA
3	San Joaquin River at Crow's Landing	11274550	7/31/2003	9:30	472	ND	NA	ND	NA
	Continued		8/7/2003	10:10	520	(0.006J)	7.63	ND	NA
			8/14/2003	10:30	389	(0.006J)	5.71	ND	NA
			8/21/2003	9:50	334	0.024	19.61	ND	NA
			8/28/2003	9:40	396	ND	NA	ND	NA
4	Del Puerto Creek at Vineyard Road	11274630	03/27/03	11:10	NA	(0.005J)	NA	ND	NA
			4/10/2003	12:20	1.6[1]	BL, ND	NA	BL, ND	NA
			4/24/2003	11:20	1.3[1]	B 0.012	0.04	B, ND	NA
			5/8/2003	11:20	1.8[1]	ND	NA	(0.009J)	0.04
			5/22/2003	11:00	0.3[1]	ND	NA	(0.016J)	0.01
			6/5/2003	11:00	0.11[1]	ND	NA	ND	NA
			6/12/2003	10:50	0.09[1]	ND	NA	ND	NA
			6/19/2003	9:40	0.05[1]	ND	NA	ND	NA
			6/26/2003	10:50	0.04[1]	ND	NA	ND	NA
			7/3/2003	9:40	0.01[1]	BL, ND	NA	BL, ND	NA
			7/10/2003	10:40	NA	ND	NA	(0.011J)	NA
			7/17/2003	11:40	NA	0.031	NA	ND	NA
			7/25/2003	10:20	NA	(0.004J)	NA	ND	NA
			7/31/2003	10:00	NA	0.011	NA	(0.009J)	NA
			8/7/2003	10:40	NA	ND	NA	(0.009J)	NA
			8/14/2003	10:50	NA	ND	NA	ND	NA
			8/21/2003	10:20	NA	(0.007J)	NA	ND	NA
			8/28/2003	10:20	NA	ND	NA	ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
5	Tuolumne River at Shilo Road	11290000	03/27/03	11:30	298	ND	NA	0.027	19.68
			4/10/2003	12:40	288	BL, ND	NA	BL, ND	NA
			4/24/2003	11:40	1020	B, ND	NA	B, ND	NA
			5/8/2003	11:50	785	ND	NA	ND	NA
			5/22/2003	11:30	743	ND	NA	(0.010J)	18.18
			6/5/2003	11:20	419	ND	NA	ND	NA
			6/12/2003	11:20	411	ND	NA	ND	NA
			6/19/2003	10:00	294	ND	NA	ND	NA
			6/26/2003	11:10	345	ND	NA	ND	NA
			7/3/2003	10:10	358	BL, ND	NA	BL, ND	NA
			7/10/2003	11:00	326	(0.005J)	3.99	ND	NA
			7/17/2003	12:00	345	0.025	21.10	ND	NA
			7/25/2003	10:50	383	(0.007J)	6.56	ND	NA
			7/31/2003	10:30	379	(0.004J)	3.71	ND	NA
			8/7/2003	11:00	370	ND	NA	ND	NA
			8/14/2003	11:10	356	ND	NA	ND	NA
			8/21/2003	10:40	361	(0.006J)	5.30	(0.010J)	8.83
			8/28/2003	10:40	424	ND	NA	(0.011J)	11.41
6	San Joaquin River at Vernalis	11303500	03/27/03	15:30	1990	(0.004J)	19.47	ND	NA
			4/10/2003	16:40	1820	BL, ND	NA	BL, ND	NA
			4/24/2003	16:00	3030	ND	NA	ND	NA
			5/8/2003	16:00	3280	ND	NA	ND	NA
			5/22/2003	15:40	2110	ND	NA	ND	NA
			6/5/2003	15:00	2060	ND	NA	ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			6/12/2003	14:40	2200	ND	NA	ND	NA
			6/19/2003	13:40	2230	ND	NA	ND	NA
6	San Joaquin River at Vernalis	11303500	6/26/2003	14:30	2180	ND	NA	ND	NA
	Continued		7/3/2003	13:20	1670	BL (0.005J)	20.43	BL, ND	NA
			7/10/2003	14:30	1400	ND	NA	ND	NA
			7/17/2003	15:50	1360	0.014	46.58	ND	NA
			7/25/2003	14:40	1340	(0.004J)	13.11	ND	NA
			7/31/2003	14:10	1380	(0.004J)	13.50	ND	NA
			8/7/2003	14:50	1440	(0.004J)	14.09	ND	NA
			8/14/2003	14:40	1340	ND	NA	ND	NA
			8/21/2003	14:10	1270	(0.007J)	21.75	ND	NA
			8/28/2003	14:20	1360	(0.004J)	13.31	ND	NA
7	Stanislaus River at Caswell S.P.	374209121103800	03/27/03	15:30	477	ND	NA	ND	NA
			4/10/2003	16:20	730	BL, ND	NA	BL, ND	NA
			4/24/2003	15:30	738	B, ND	NA	B (0.014J)	25.28
			5/8/2003	15:30	667	ND	NA	ND	NA
			5/22/2003	15:10	758	ND	NA	ND	NA
			6/5/2003	14:30	1010	ND	NA	ND	NA
			6/12/2003	14:10	1210	ND	NA	ND	NA
			6/19/2003	13:10	1280	ND	NA	ND	NA
			6/26/2003	14:10	1270	0.018	55.93	ND	NA
			7/3/2003	12:50	692	BL 0.012	20.32	BL, ND	NA
			7/10/2003	14:00	505	0.06	74.13	ND	NA
			7/17/2003	15:20	452	(0.007J)	7.74	ND	NA
			7/25/2003	14:00	454	ND	NA	ND	NA
			7/31/2003	13:40	439	ND	NA	ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			8/7/2003	14:20	362	ND	NA	ND	NA
			8/14/2003	14:10	308	0.067	50.49	ND	NA
7	Stanislaus River at Caswell S.P.	374209121103800	8/21/2003	13:50	313	(0.008J)	6.13	ND	NA
	Continued		8/28/2003	13:50	296	ND	NA	ND	NA
8	Dry Creek at Gallo Bridge	373811120590001	03/27/03	12:20	25	B, ND	NA	B, ND	NA
			4/10/2003	13:50	15	BL, ND	NA	BL 0.041	1.50
			4/24/2003	12:10	28	ND	NA	ND	NA
			5/8/2003	12:40	17	ND	NA	(0.010J)	0.42
			5/22/2003	12:20	43	ND	NA	ND	NA
			6/5/2003	11:50	53	ND	NA	ND	NA
			6/12/2003	11:50	51	ND	NA	ND	NA
			6/19/2003	10:40	36	ND	NA	ND	NA
			6/26/2003	11:40	45	ND	NA	ND	NA
			7/3/2003	10:30	66	BL, ND	NA	BL, ND	NA
			7/10/2003	11:30	35	(0.008J)	0.69	ND	NA
			7/17/2003	12:40	54	ND	NA	ND	NA
			7/25/2003	11:30	88	0.024	5.17	ND	NA
			7/31/2003	11:10	44	(0.007J)	0.75	ND	NA
			8/7/2003	11:40	66	ND	NA	ND	NA
			8/14/2003	11:50	93	0.014	3.19	ND	NA
			8/21/2003	11:20	75	(0.008J)	1.47	ND	NA
			8/28/2003	11:20	108	(0.004J)	1.06	ND	NA
9	Tuolumne River at Santa Fe Road	373733120539700	03/27/03	12:40	264	ND	NA	ND	NA
			4/10/2003	14:10	270	BL, ND	NA	BL (0.010J)	6.61

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Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			4/24/2003	13:40	1001	B, ND	NA	B, ND	NA
			5/8/2003	13:10	740	ND	NA	ND	NA
9	Tuolumne River at Santa Fe Road	373733120539700	5/22/2003	12:40	660	ND	NA	0.041	66.20
	Continued		6/5/2003	12:10	366	0.04	35.82	ND	NA
			6/12/2003	12:10	368	0.012	10.80	ND	NA
			6/19/2003	11:00	258	ND	NA	ND	NA
			6/26/2003	12:00	300	ND	NA	ND	NA
			7/3/2003	11:00	292	BL, ND	NA	BL, ND	NA
			7/10/2003	11:50	293	ND	NA	ND	NA
			7/17/2003	13:00	293	0.023	16.49	ND	NA
			7/25/2003	11:50	295	(0.009J)	6.50	ND	NA
			7/31/2003	11:30	333	ND	NA	ND	NA
			8/7/2003	11:50	300	(0.007J)	5.14	ND	NA
			8/14/2003	12:00	256	ND	NA	ND	NA
			8/21/2003	11:30	285	(0.006J)	4.18	(0.019J)	13.25
			8/28/2003	11:30	315	ND	NA	0.02	15.41
10	Stanislaus River at Orange Blossom	377830120750000	03/27/03	14:00	441	ND	NA	ND	NA
			4/10/2003	14:50	657	BL, ND	NA	BL, ND	NA
			4/24/2003	14:30	911	ND	NA	ND	NA
			5/8/2003	14:10	514	ND	NA	ND	NA
			5/22/2003	13:40	653	ND	NA	ND	NA
			6/5/2003	13:20	1020	ND	NA	ND	NA
			6/12/2003	13:10	1082	ND	NA	ND	NA
			6/19/2003	12:10	1232	ND	NA	ND	NA
			6/26/2003	13:10	1238	ND	NA	ND	NA
			7/3/2003	12:00	596	B, BL, ND	NA	B, BL, ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			7/10/2003	13:00	492	ND	NA	ND	NA
			7/17/2003	14:20	459	ND	NA	ND	NA
10	Stanislaus River at Orange Blossom	377830120750000	7/25/2003	12:50	369	ND	NA	ND	NA
	Continued		7/31/2003	12:40	403	ND	NA	ND	NA
			8/7/2003	13:20	344	ND	NA	ND	NA
			8/14/2003	13:00	306	ND	NA	ND	NA
			8/21/2003	12:40	309	ND	NA	ND	NA
			8/28/2003	12:50	300	ND	NA	ND	NA
11	Stanislaus River at Jacob Meyer Park	374455120564600	03/27/03	14:40	455	ND	NA	ND	NA
			4/10/2003	15:30	688	BL, ND	NA	BL, ND	NA
			4/24/2003	15:00	833	B, ND	NA	B, ND	NA
			5/8/2003	14:40	584	ND	NA	ND	NA
			5/22/2003	14:20	706	ND	NA	ND	NA
			6/5/2003	13:50	1016	ND	NA	ND	NA
			6/12/2003	13:40	1143	ND	NA	ND	NA
			6/19/2003	12:40	1253	ND	NA	ND	NA
			6/26/2003	13:30	1249	ND	NA	ND	NA
			7/3/2003	12:30	639	BL (0.008J)	12.51	BL, ND	NA
			7/10/2003	13:20	497	BRK	NA	BRK	NA
			7/17/2003	14:40	456	(0.009J)	10.04	ND	NA
			7/25/2003	13:20	409	0.011	11.01	ND	NA
			7/31/2003	13:10	417	0.022	22.44	ND	NA
			8/7/2003	13:40	354	ND	NA	ND	NA
			8/14/2003	13:30	307	0.023	17.27	ND	NA
			8/21/2003	13:10	311	ND	NA	ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			8/28/2003	13:20	298	0.011	8.02	ND	NA
12	Salt Slough at Lander Avenue	11261100	03/27/03	9:10	286	0.016	11.20	ND	NA
			4/10/2003	10:10	152	B, BL (0.006J)	2.23	B, BL, ND	NA
			4/24/2003	9:30	116	(0.006J)	1.70	ND	NA
			5/8/2003	9:40	114	(0.008J)	2.23	ND	NA
			5/22/2003	8:10	124	ND	NA	(0.013J)	3.94
			6/5/2003	9:20	124	0.032	9.71	ND	NA
			6/12/2003	9:20	106	ND	NA	ND	NA
			6/19/2003	8:00	99	ND	NA	ND	NA
			6/26/2003	9:20	157	(0.009J)	3.46	ND	NA
			7/3/2003	8:20	n/a	BL 0.014	NA	BL, ND	NA
			7/10/2003	9:00	n/a	(0.004J)	NA	ND	NA
			7/17/2003	9:40	n/a	0.016	NA	ND	NA
			7/25/2003	8:30	n/a	(0.006J)	NA	ND	NA
			7/31/2003	8:10	174	(0.005J)	2.13	ND	NA
			8/7/2003	9:10	198	(0.004J)	1.94	ND	NA
			8/14/2003	9:20	103	0.011	2.77	ND	NA
			8/21/2003	8:40	111	0.010	2.72	ND	NA
			8/28/2003	8:40	142	(0.009J)	3.13	ND	NA
13	San Joaquin River at Lander Avenue	11260815	03/27/03	9:30	3	0.06	0.44	ND	NA
			4/10/2003	10:30	0	B, BL (0.007J)	NA	B, BL, ND	NA
			4/24/2003	9:50	NA	B, ND	NA	B, ND	NA
			5/8/2003	9:50	NA	ND	NA	ND	NA
			5/22/2003	8:30	7	B, ND	NA	B, ND	NA

Table 4. Summary of environmental data collected on diazinon and chlorpyrifos concentrations and instantaneous loading rates for sites in the San Joaquin River Basin, California, March-August 2003.

Stream flow is in cubic feet per second. J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. NA: not available. ND: Not detected. BRK: sample broken in lab; g a.i./d: grams active ingredient per day; µg/L: microgram per liter. [1]Adjusted discharge estimate - see Discharge Methods section for explanation.

Site number	Site name	Site identification number	Date (month/day/year)	Time (24 hr)	Stream flow (cfs)	Chlorpyrifos concentration (µg/L)	Chlorpyrifos instantaneous loading rate (g a.i./d)	Diazinon concentration (µg/L)	Diazinon instantaneous loading rate (g a.i./d)
			6/5/2003	9:40	7	ND	NA	ND	NA
			6/12/2003	9:30	14	ND	NA	ND	NA
			6/19/2003	8:10	15	ND	NA	ND	NA
13	San Joaquin River at Lander Avenue	11260815	6/26/2003	9:30	9	ND	NA	ND	NA
	Continued		7/3/2003	8:30	10	B, BL, ND	NA	B, BL, ND	NA
			7/10/2003	9:10	13	ND	NA	ND	NA
			7/17/2003	9:50	11	ND	NA	ND	NA
			7/25/2003	8:50	8	ND	NA	ND	NA
			7/31/2003	8:20	21	ND	NA	ND	NA
			8/7/2003	9:20	13	ND	NA	ND	NA
			8/14/2003	9:30	3	ND	NA	ND	NA
			8/21/2003	9:00	3	ND	NA	ND	NA
			8/28/2003	8:50	2	ND	NA	ND	NA

Table 5. Summary of diazinon and chlorpyrifos concentrations quality-control data for sites in the San Joaquin River Basin, California, March-August 2003.

NA: not applicable - cannot be calculated because of "less than" concentration; µg/L: microgram per liter; B:possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike; E: estimate; <: less than

Site identification number	Site name	Date and time (month/day/year 24-hour time)	Chlorpyrifos (ug/L)	Relative percent difference OR percent recovery (chlorpyrifos)	Diazinon (ug/L)	Relative percent difference OR percent recovery (diazinon)
DUPLICATES						
11260815	San Joaquin River at Lander Avenue	4/10/2003 10:30	E 0.007		<0.007	
		4/10/2003 10:33	B, BL, E 0.009	25%	B, BL <0.007	NA
11274550	San Joaquin River at Crow's Landing	5/8/2003 10:50	<0.004		<0.007	
		5/8/2003 10:53	<0.004	NA	<0.007	NA
373811120590001	Dry Creek at Gallo Bridge	6/5/2003 11:50	<0.004		<0.007	
		6/5/2003 11:53	<0.004	NA	E 0.016	
374455120564600	Stanislaus River at Jacob Meyers Park	6/19/2003 12:40	<0.004		<0.007	
		6/19/2003 12:43	<0.004	NA	<0.007	NA
11261100	Salt Slough at Lander Avenue	7/3/2003 08:20	BL 0.014		BL <0.007	
		7/3/2003 08:23	BL 0.016	13.33%	BL <0.007	NA
BLANKS						
11261100	Salt Slough at Lander Avenue	3/27/2003 09:11	<0.004		<0.007	
11274538	Orestimba Creek at River Road	4/24/2003 10:41	B <0.004		B <0.007	
11290200	Tuolumne River at Shilo Road	5/22/2003 11:31	<0.004		<0.007	
377830120750000	Stanislaus River at Orange Blossom	6/12/2003 13:11	<0.004		<0.007	
11303500	San Joaquin River at Vernalis	6/26/2003 14:31	<0.004		<0.007	
SPIKES [1,2]						
11273500	Merced River at River Road	4/10/2003 11:20	<0.004		<0.007	
		4/10/2003 11:29		76%		100%
11274653	Del Puerto Creek at Vineyard Road	5/8/2003 11:20	<0.004		E 0.009	
		5/8/2003 11:29		77%		120%
373733120539700	Tuolumne River at Santa Fe Road	6/5/2003 12:10	0.040		<0.007	
		6/5/2003 12:19		108%		99%
374209121103800	Stanislaus River at Caswell State Park	6/19/2003 13:10	<0.004		<0.007	
		6/19/2003 13:19		100%		84%
11260815	San Joaquin River at Lander Avenue	7/3/2003 08:30	BL <0.004		BL<0.007	
		7/3/2003 08:39		93%		66%

[1] Spiked samples were injected with 0.05 ug/L of chlorpyrifos; 0.10 ug/L of diazinon
[2] First sample in each pair is the environmental sample, second sample is matrix spike.

Sources Cited

Azimi-Gaylon, S., and E. Reyes. 2002. Quality Assurance Project Plan for Monitoring Organophosphorous Pesticides in the Lower San Joaquin Basin. CVRWQCB-Sacramento, California.

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Appendix A

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

(Concentrations are in units of µg/L. ND: Not detected; BRK: sample broken in lab; J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. Each sample was also analyzed for Azinphos methyl, l-Cyhalothrin, Cyfluthrins, Cypermethrins, Esfenvalerate, Disulfoton, Dacthal (DCPA) and Methidathion which were not present at detectable levels).

Site	Date	Time	EPTC (Eptam)	Simazine	Carbaryl	Metolachlor	Cyan-azine	Propargite	Bifenthrin
Merced River at River Rd.	3/27/2003	10:10	ND	(0.013 J)	ND	ND	ND	ND	ND
Merced River at River Rd.	4/10/2003	11:20	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Merced River at River Rd.	4/24/2003	10:20	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND
Merced River at River Rd.	5/8/2003	10:20	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	5/22/2003	9:20	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	6/5/2003	10:00	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	6/12/2003	10:00	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	6/19/2003	8:40	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	6/26/2003	10:00	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	7/3/2003	8:50	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	7/10/2003	9:40	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	7/17/2003	10:20	ND	ND	(0.017 J)	ND	ND	ND	ND
Merced River at River Rd.	7/25/2003	9:10	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	7/31/2003	8:50	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Merced River at River Rd.	8/7/2003	9:40	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	8/14/2003	10:00	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	8/21/2003	9:20	ND	ND	ND	ND	ND	ND	ND
Merced River at River Rd.	8/28/2003	9:10	ND	ND	ND	ND	ND	ND	ND
Orestimba Creek at River Rd.	3/27/2003	10:20	ND	(0.024 J)	ND	ND	ND	ND	ND
Orestimba Creek at River Rd.	4/10/2003	11:30	BL, ND	BL (0.036 J)	BL, ND	BL (0.011 J)	BL, ND	BL, ND	BL, ND
Orestimba Creek at River Rd.	4/24/2003	10:40	B, ND	B (0.020 J)	B, ND	B 0.064	B, ND	B, ND	B, ND
Orestimba Creek at River Rd.	5/8/2003	10:40	0.26	(0.020 J)	ND	0.13	ND	ND	ND
Orestimba Creek at River Rd.	5/22/2003	9:50	0.31	(0.026 J)	0.17	0.56	ND	ND	ND
Orestimba Creek at River Rd.	6/5/2003	10:20	(0.038 J)	(0.007 J)	ND	0.46	ND	ND	ND
Orestimba Creek at River Rd.	6/12/2003	10:20	ND	(0.014 J)	(0.008 J)	0.78	ND	ND	ND
Orestimba Creek at River Rd.	6/19/2003	9:00	0.098	(0.009 J)	0.021	0.292	ND	(0.230 J)	ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

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Orestimba Creek at River Rd.	6/26/2003	10:10	(0.032 J)	(0.006 J)	ND	0.49	ND	ND	ND
Orestimba Creek at River Rd.	7/3/2003	9:10	BL, ND	BL, ND	BL, ND	BL 0.34	BL, ND	BL, ND	BL, ND
Orestimba Creek at River Rd.	7/10/2003	10:00	0.056	(0.006 J)	ND	0.16	ND	ND	ND
Orestimba Creek at River Rd.	7/17/2003	10:40	ND	ND	ND	0.42	ND	ND	ND
Orestimba Creek at River Rd.	7/25/2003	9:40	(0.030 J)	ND	ND	0.19	ND	ND	ND
Orestimba Creek at River Rd.	7/31/2003	9:10	ND	ND	ND	0.21	ND	ND	ND
Orestimba Creek at River Rd.	8/7/2003	10:00	ND	(0.009 J)	ND	0.11	ND	ND	ND
Orestimba Creek at River Rd.	8/14/2003	10:20	ND	(0.005 J)	ND	0.31	ND	(0.18 J)	ND
Orestimba Creek at River Rd.	8/21/2003	9:40	ND	ND	ND	0.11	ND	ND	ND
Orestimba Creek at River Rd.	8/28/2003	9:30	ND	(0.021 J)	ND	0.049	ND	0.94	ND
San Joaquin River at Crows Landing	3/27/2003	10:40	ND	(0.013 J)	ND	(0.014 J)	ND	ND	ND
San Joaquin River at Crows Landing	4/10/2003	11:50	BL, ND	BL (0.009 J)	BL, ND	BL (0.008 J)	BL, ND	BL, ND	BL, ND
San Joaquin River at Crows Landing	4/24/2003	10:50	B (0.026 J)	B (0.006 J)	B, ND	B (0.012 J)	B, ND	B, ND	B, ND
San Joaquin River at Crows Landing	5/8/2003	10:50	ND	(0.005 J)	ND	(0.020 J)	ND	ND	ND
San Joaquin River at Crows Landing	5/22/2003	10:20	1.4	(0.011 J)	ND	0.17	ND	ND	ND
San Joaquin River at Crows Landing	6/5/2003	10:30	(0.040 J)	(0.007 J)	ND	0.1	ND	ND	ND
San Joaquin River at Crows Landing	6/12/2003	10:30	ND	(0.006 J)	ND	0.065	ND	ND	ND
San Joaquin River at Crows Landing	6/19/2003	9:10	(0.036 J)	ND	ND	0.097	ND	ND	ND
San Joaquin River at Crows Landing	6/26/2003	10:30	(0.022 J)	(0.006 J)	ND	0.18	ND	ND	ND
San Joaquin River at Crows Landing	7/3/2003	9:20	BL, ND	BL, ND	BL, ND	BL 0.096	BL, ND	BL, ND	BL, ND
San Joaquin River at Crows Landing	7/10/2003	10:10	0.19	ND	ND	0.16	ND	ND	ND
San Joaquin River at Crows Landing	7/17/2003	11:10	(0.031 J)	ND	ND	0.26	ND	ND	ND
San Joaquin River at Crows Landing	7/25/2003	10:00	(0.026 J)	ND	(0.011 J)	0.13	ND	ND	ND
San Joaquin River at Crows Landing	7/31/2003	9:30	0.096	ND	ND	0.16	ND	ND	ND
San Joaquin River at Crows Landing	8/7/2003	10:10	0.059	(0.005 J)	(0.011 J)	0.11	ND	ND	ND
San Joaquin River at Crows Landing	8/14/2003	10:30	0.15	(0.005 J)	ND	0.098	ND	ND	ND
San Joaquin River at Crows Landing	8/21/2003	9:50	ND	ND	ND	0.077	ND	ND	ND
San Joaquin River at Crows Landing	8/28/2003	9:40	ND	ND	ND	0.066	ND	ND	ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

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Del Puerto Creek at Vineyard Rd.	3/27/2003	11:10	ND	(0.034 J)	ND	0.054	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	4/10/2003	12:20	BL, 0.077	BL, 0.290	BL, ND	BL (0.007 J)	BL, ND	BL, ND	BL, ND
Del Puerto Creek at Vineyard Rd.	4/24/2003	11:20	B (0.039 J)	B (0.160 J)	B, ND	B 0.024	B, ND	B, ND	B, ND
Del Puerto Creek at Vineyard Rd.	5/8/2003	11:20	0.12	(0.027 J)	ND	0.15	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	5/22/2003	11:00	0.47	(0.031 J)	0.059	0.42	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	6/5/2003	11:00	ND	(0.012 J)	ND	0.17	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	6/12/2003	10:50	0.05	(0.044 J)	ND	0.13	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	6/19/2003	9:40	0.05	(0.008 J)	ND	0.069	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	6/26/2003	10:50	(0.037 J)	(0.009 J)	0.026	0.15	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	7/3/2003	9:40	BL, ND	BL (0.089 J)	BL 1.820	BL, 0.061	BL, ND	BL, ND	BL, ND
Del Puerto Creek at Vineyard Rd.	7/10/2003	10:40	0.088	(0.006 J)	ND	0.08	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	7/17/2003	11:40	ND	(0.009 J)	ND	0.29	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	7/25/2003	10:20	ND	(0.010 J)	0.03	0.076	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	7/31/2003	10:00	ND	ND	ND	0.29	ND	ND	(0.008 J)
Del Puerto Creek at Vineyard Rd.	8/7/2003	10:40	ND	ND	ND	0.41	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	8/14/2003	10:50	ND	(0.015 J)	ND	0.04	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	8/21/2003	10:20	ND	(0.005 J)	ND	0.037	ND	ND	ND
Del Puerto Creek at Vineyard Rd.	8/28/2003	10:20	ND	(0.019 J)	ND	0.033	ND	ND	ND
Tuolumne River at Shilo Rd.	3/27/2003	11:30	ND	(0.014 J)	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	4/10/2003	12:40	BL, ND	BL, (0.012 J)	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Tuolumne River at Shilo Rd.	4/24/2003	11:40	B, ND	B (0.006 J)	B, ND	B, ND	B, ND	B, ND	B, ND
Tuolumne River at Shilo Rd.	5/8/2003	11:50	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	5/22/2003	11:30	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	6/5/2003	11:20	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	6/12/2003	11:20	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	6/19/2003	10:00	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	6/26/2003	11:10	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	7/3/2003	10:10	BL, ND	BL (0.005 J)	BL 0.040	BL, ND	BL, ND	BL, ND	BL, ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

(Concentrations are in units of µg/L. ND: Not detected; BRK: sample broken in lab; J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. Each sample was also analyzed for Azinphos methyl, l-Cyhalothrin, Cyfluthrins, Cypermethrins, Esfenvalerate, Disulfoton, Dacthal (DCPA) and Methidathion which were not present at detectable levels).

Tuolumne River at Shilo Rd.	7/10/2003	11:00	ND	ND	(0.012 J)	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	7/17/2003	12:00	ND	(0.046 J)	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	7/25/2003	10:50	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	7/31/2003	10:30	ND	ND	ND	(0.013 J)	ND	ND	ND
Tuolumne River at Shilo Rd.	8/7/2003	11:00	ND	(0.008 J)	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	8/14/2003	11:10	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	8/21/2003	10:40	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Shilo Rd.	8/28/2003	10:40	ND	(0.012 J)	ND	ND	ND	ND	ND
San Joaquin River at Vernalis	03/27/03	15:30	ND	(0.042 J)	ND	(0.007 J)	ND	ND	ND
San Joaquin River at Vernalis	4/10/2003	16:40	B, BL, ND	B, BL (0.011 J)	B, BL (0.009 J)	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND
San Joaquin River at Vernalis	4/24/2003	16:00	ND	(0.015 J)	ND	(0.012 J)	ND	ND	ND
San Joaquin River at Vernalis	5/8/2003	16:00	ND	(0.006 J)	ND	0.033	ND	ND	ND
San Joaquin River at Vernalis	5/22/2003	15:40	0.5	(0.006 J)	0.043	0.14	ND	ND	ND
San Joaquin River at Vernalis	6/5/2003	15:00	ND	(0.006 J)	ND	0.033	ND	ND	ND
San Joaquin River at Vernalis	6/12/2003	14:40	ND	ND	(0.007 J)	0.03	ND	ND	ND
San Joaquin River at Vernalis	6/19/2003	13:40	ND	ND	ND	0.035	ND	ND	ND
San Joaquin River at Vernalis	6/26/2003	14:30	ND	ND	ND	0.042	ND	ND	ND
San Joaquin River at Vernalis	7/3/2003	13:20	BL, ND	BL, ND	BL, ND	BL 0.041	BL, ND	BL, ND	BL, ND
San Joaquin River at Vernalis	7/10/2003	14:30	ND	(0.006 J)	ND	0.052	ND	ND	ND
San Joaquin River at Vernalis	7/17/2003	15:50	ND	ND	ND	0.089	ND	ND	ND
San Joaquin River at Vernalis	7/25/2003	14:40	ND	(0.012 J)	ND	0.034	ND	ND	ND
San Joaquin River at Vernalis	7/31/2003	14:10	ND	ND	ND	0.052	ND	ND	ND
San Joaquin River at Vernalis	8/7/2003	14:50	ND	(0.028 J)	ND	0.034	ND	ND	ND
San Joaquin River at Vernalis	8/14/2003	14:40	ND	(0.006 J)	ND	0.037	ND	ND	ND
San Joaquin River at Vernalis	8/21/2003	14:10	ND	ND	ND	0.02	ND	ND	ND
San Joaquin River at Vernalis	8/28/2003	14:20	ND	(0.013 J)	ND	(0.016 J)	ND	ND	ND
Stanislaus River at Caswell State Park	03/27/03	15:30	ND	(0.014 J)	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	4/10/2003	16:20	BL, ND	BL, ND	BL (0.012 J)	BL, ND	BL, ND	BL, ND	BL, ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

(Concentrations are in units of µg/L. ND: Not detected; BRK: sample broken in lab; J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. Each sample was also analyzed for Azinphos methyl, l-Cyhalothrin, Cyfluthrins, Cypermethrins, Esfenvalerate, Disulfoton, Dacthal (DCPA) and Methidathion which were not present at detectable levels).

Stanislaus River at Caswell State Park	4/24/2003	15:30	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND
Stanislaus River at Caswell State Park	5/8/2003	15:30	ND	ND	0.021	ND	ND	ND	ND
Stanislaus River at Caswell State Park	5/22/2003	15:10	ND	ND	0.03	ND	ND	ND	ND
Stanislaus River at Caswell State Park	6/5/2003	14:30	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	6/12/2003	14:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	6/19/2003	13:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	6/26/2003	14:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	7/3/2003	12:50	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Stanislaus River at Caswell State Park	7/10/2003	14:00	ND	(0.10 J)	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	7/17/2003	15:20	ND	ND	0.047	ND	ND	ND	ND
Stanislaus River at Caswell State Park	7/25/2003	14:00	ND	ND	0.063	ND	ND	ND	ND
Stanislaus River at Caswell State Park	7/31/2003	13:40	ND	ND	0.052	ND	ND	ND	ND
Stanislaus River at Caswell State Park	8/7/2003	14:20	ND	ND	(0.014 J)	ND	ND	ND	ND
Stanislaus River at Caswell State Park	8/14/2003	14:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	8/21/2003	13:50	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Caswell State Park	8/28/2003	13:50	ND	ND	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	03/27/03	12:20	ND	B (0.13 J)	B (0.012 J)	B, ND	B, ND	B, ND	B, ND
Dry Creek at Gallo Bridge	4/10/2003	13:50	BL, ND	BL (0.053 J)	BL (0.012 J)	BL, ND	BL, ND	BL, ND	BL, ND
Dry Creek at Gallo Bridge	4/24/2003	12:10	ND	0.22	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	5/8/2003	12:40	ND	(0.038 J)	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	5/22/2003	12:20	ND	(0.012 J)	0.06	ND	ND	ND	ND
Dry Creek at Gallo Bridge	6/5/2003	11:50	ND	(0.008 J)	0.05	ND	ND	ND	ND
Dry Creek at Gallo Bridge	6/12/2003	11:50	ND	(0.014 J)	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	6/19/2003	10:40	ND	ND	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	6/26/2003	11:40	ND	1.62	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	7/3/2003	10:30	BL, ND	BL (0.008 J)	BL 0.085	BL, ND	BL, ND	BL, ND	BL, ND
Dry Creek at Gallo Bridge	7/10/2003	11:30	ND	ND	0.26	ND	ND	ND	ND
Dry Creek at Gallo Bridge	7/17/2003	12:40	ND	(0.024 J)	0.05	(0.008 J)	ND	ND	ND

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Dry Creek at Gallo Bridge	7/25/2003	11:30	ND	(0.007 J)	0.022	ND	ND	ND	ND
Dry Creek at Gallo Bridge	7/31/2003	11:10	ND	ND	ND	0.062	ND	ND	ND
Dry Creek at Gallo Bridge	8/7/2003	11:40	ND	ND	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	8/14/2003	11:50	ND	(0.010 J)	ND	(0.008 J)	ND	ND	ND
Dry Creek at Gallo Bridge	8/21/2003	11:20	ND	(0.007 J)	ND	ND	ND	ND	ND
Dry Creek at Gallo Bridge	8/28/2003	11:20	ND	(0.059 J)	ND	(0.012 J)	ND	ND	ND
Tuolumne River at Santa Fe Rd.	03/27/03	12:40	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	4/10/2003	14:10	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Tuolumne River at Santa Fe Rd.	4/24/2003	13:40	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND
Tuolumne River at Santa Fe Rd.	5/8/2003	13:10	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	5/22/2003	12:40	ND	ND	0.039	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	6/5/2003	12:10	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	6/12/2003	12:10	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	6/19/2003	11:00	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	6/26/2003	12:00	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	7/3/2003	11:00	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Tuolumne River at Santa Fe Rd.	7/10/2003	11:50	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	7/17/2003	13:00	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	7/25/2003	11:50	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	7/31/2003	11:30	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	8/7/2003	11:50	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	8/14/2003	12:00	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	8/21/2003	11:30	ND	ND	ND	ND	ND	ND	ND
Tuolumne River at Santa Fe Rd.	8/28/2003	11:30	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	03/27/03	14:00	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	4/10/2003	14:50	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND	BL, ND
Stanislaus River at Orange Blossom	4/24/2003	14:30	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	5/8/2003	14:10	ND	ND	ND	ND	ND	ND	ND

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Stanislaus River at Orange Blossom	5/22/2003	13:40	ND	ND	0.036	ND	ND	ND	ND
Stanislaus River at Orange Blossom	6/5/2003	13:20	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	6/12/2003	13:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	6/19/2003	12:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	6/26/2003	13:10	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	7/3/2003	12:00	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND
Stanislaus River at Orange Blossom	7/10/2003	13:00	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	7/17/2003	14:20	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	7/25/2003	12:50	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	7/31/2003	12:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	8/7/2003	13:20	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	8/14/2003	13:00	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	8/21/2003	12:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Orange Blossom	8/28/2003	12:50	ND	ND	ND	ND	ND	ND	(0.008 J)
Stanislaus River at Jacob Meyers Park	03/27/03	14:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	4/10/2003	15:30	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND	B, BL, ND
Stanislaus River at Jacob Meyers Park	4/24/2003	15:00	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND	B, ND
Stanislaus River at Jacob Meyers Park	5/8/2003	14:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	5/22/2003	14:20	ND	ND	0.14	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	6/5/2003	13:50	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	6/12/2003	13:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	6/19/2003	12:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	6/26/2003	13:30	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	7/3/2003	12:30	BL, ND	BL, ND	BL 0.12	BL, ND	BL, ND	BL, ND	BL, ND
Stanislaus River at Jacob Meyers Park	7/10/2003	13:20	BRK	BRK	BRK	BRK	BRK	BRK	BRK
Stanislaus River at Jacob Meyers Park	7/17/2003	14:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	7/25/2003	13:20	ND	ND	0.02	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	7/31/2003	13:10	ND	ND	(0.015 J)	ND	ND	ND	ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

(Concentrations are in units of µg/L. ND: Not detected; BRK: sample broken in lab; J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. Each sample was also analyzed for Azinphos methyl, l-Cyhalothrin, Cyfluthrins, Cypermethrins, Esfenvalerate, Disulfoton, Dacthal (DCPA) and Methidathion which were not present at detectable levels).

Stanislaus River at Jacob Meyers Park	8/7/2003	13:40	ND	ND	ND	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	8/14/2003	13:30	ND	ND	(0.008 J)	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	8/21/2003	13:10	ND	ND	(0.008 J)	ND	ND	ND	ND
Stanislaus River at Jacob Meyers Park	8/28/2003	13:20	ND	ND	ND	ND	ND	ND	ND
Salt Slough at Lander Avenue	03/27/03	9:10	ND	(0.010 J)	ND	0.024	ND	ND	ND
Salt Slough at Lander Avenue	4/10/2003	10:10	B, BL, ND	B, BL (0.010 J)	B, BL, ND	B, BL 0.028	B, BL, ND	B, BL, ND	B, BL, ND
Salt Slough at Lander Avenue	4/24/2003	9:30	0.085	(0.008 J)	ND	0.021	ND	ND	ND
Salt Slough at Lander Avenue	5/8/2003	9:40	ND	(0.010 J)	ND	0.1	ND	ND	ND
Salt Slough at Lander Avenue	5/22/2003	8:10	0.41	(0.017 J)	(0.017 J)	0.17	ND	ND	ND
Salt Slough at Lander Avenue	6/5/2003	9:20	0.11	(0.008 J)	ND	0.22	ND	ND	ND
Salt Slough at Lander Avenue	6/12/2003	9:20	0.763	(0.005 J)	ND	0.122	ND	ND	ND
Salt Slough at Lander Avenue	6/19/2003	8:00	0.224	ND	0.121	ND	ND	ND	ND
Salt Slough at Lander Avenue	6/26/2003	9:20	0.054	ND	ND	0.49	ND	ND	ND
Salt Slough at Lander Avenue	7/3/2003	8:20	BL (0.024 J)	BL, ND	BL, ND	BL 0.16	BL, ND	BL, ND	BL, ND
Salt Slough at Lander Avenue	7/10/2003	9:00	(0.048 J)	ND	ND	0.45	ND	ND	ND
Salt Slough at Lander Avenue	7/17/2003	9:40	0.12	ND	ND	0.39	ND	ND	ND
Salt Slough at Lander Avenue	7/25/2003	8:30	(0.038 J)	ND	ND	0.23	ND	ND	ND
Salt Slough at Lander Avenue	7/31/2003	8:10	ND	ND	ND	0.19	ND	ND	ND
Salt Slough at Lander Avenue	8/7/2003	9:10	(0.040 J)	ND	ND	0.16	ND	ND	ND
Salt Slough at Lander Avenue	8/14/2003	9:20	0.21	ND	ND	0.13	ND	ND	ND
Salt Slough at Lander Avenue	8/21/2003	8:40	ND	ND	ND	0.062	ND	ND	ND
Salt Slough at Lander Avenue	8/28/2003	8:40	0.16	ND	ND	0.074	ND	ND	ND
San Joaquin River at Lander Avenue	03/27/03	9:30	ND	(0.009 J)	ND	0.14	(0.007 J)	ND	ND
San Joaquin River at Lander Avenue	4/10/2003	10:30	B, BL, ND	B, BL (0.030 J)	B, BL, ND	B, BL 0.033	B, BL, ND	B, BL, ND	B, BL, ND
San Joaquin River at Lander Avenue	4/24/2003	9:50	B, ND	B (0.012 J)	B, ND	B 0.032	B, ND	B, ND	B, ND
San Joaquin River at Lander Avenue	5/8/2003	9:50	ND	(0.008 J)	ND	0.069	ND	ND	ND
San Joaquin River at Lander Avenue	5/22/2003	8:30	B, ND	B, ND	B, ND	B 0.13	B, ND	B, ND	B, ND
San Joaquin River at Lander Avenue	6/5/2003	9:40	ND	ND	ND	0.046	ND	ND	ND

Appendix A. Pesticide results (excluding diazinon and chlorpyrifos).

(Concentrations are in units of µg/L. ND: Not detected; BRK: sample broken in lab; J: the reported concentrations were below the quantitative limit and are considered estimates; B: possibly biased low due to low surrogate recovery in sample; BL: possibly biased low due to low surrogate recovery in associated lab blank or lab control spike. Each sample was also analyzed for Azinphos methyl, l-Cyhalothrin, Cyfluthrins, Cypermethrins, Esfenvalerate, Disulfoton, Dacthal (DCPA) and Methidathion which were not present at detectable levels).

San Joaquin River at Lander Avenue	6/12/2003	9:30	ND	ND	ND	0.271	ND	ND	ND
San Joaquin River at Lander Avenue	6/19/2003	8:10	ND	(0.007 J)	ND	0.759	ND	ND	ND
San Joaquin River at Lander Avenue	6/26/2003	9:30	ND	ND	ND	0.45	ND	ND	ND
San Joaquin River at Lander Avenue	7/3/2003	8:30	B, BL, ND	B, BL, ND	B, BL, ND	B, BL 0.48	B, BL, ND	B, BL, ND	B, BL, ND
San Joaquin River at Lander Avenue	7/10/2003	9:10	ND	ND	ND	0.27	ND	ND	ND
San Joaquin River at Lander Avenue	7/17/2003	9:50	ND	ND	ND	0.2	ND	ND	ND
San Joaquin River at Lander Avenue	7/25/2003	8:50	ND	ND	ND	0.13	ND	ND	ND
San Joaquin River at Lander Avenue	7/31/2003	8:20	ND	ND	ND	0.28	ND	ND	ND
San Joaquin River at Lander Avenue	8/7/2003	9:20	ND	ND	ND	2.3	ND	(0.120 J)	ND
San Joaquin River at Lander Avenue	8/14/2003	9:30	ND	ND	ND	1.67	ND	ND	ND
San Joaquin River at Lander Avenue	8/21/2003	9:00	ND	ND	ND	2	ND	ND	ND
San Joaquin River at Lander Avenue	8/28/2003	8:50	ND	ND	ND	1.1	ND	ND	(0.032 J)